Is Bloat From Clover a Problem in Pastures and Hay Fields?

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Adding legumes to grass pastures and hay fields offers many benefits to forage system sustainability. Legumes in grass pastures improve animal performance, increase nutritional quality of hay and pasture, extend grazing seasons and reduce the need for nitrogen fertilizer. In the 2011 Legume Management Survey, over 40 percent of Arkansas producers reported having added clover to pastures within the past five years, and over 25 percent planted clover in fescue pastures to reduce fescue toxicity in their livestock.

Bloat of livestock grazing clover is often mentioned as a concern. However, bloat was ranked last in a list of reasons why producers choose not to grow clover (Figure 1). Although bloat is feared, the incidence of bloat in livestock was low among survey respondents (Figure 2). A forage specialist from Kentucky once stated that more pounds of beef are lost each year from fear of bloat than from bloat itself. That statement could probably be applied to small ruminants as well.

What Is Bloat?

Bloat in ruminant animals occurs when fermentation gases produced in the animal’s rumen during digestion cannot be expelled through normal eructation (belching and cud chewing). Bloat caused by grazing clover is due to highly soluble protein from the clover that forms a stable foam in the rumen. In a way, it’s like the foam on top of your soft drink that won’t go away.

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Reasons for Not Growing Legumes

![Figure 1. Ranking of reasons producers do not grow clover in pastures. 2011 Legume Management Survey.](image-url)
Summer is almost here, and fair season will soon heat up in Arkansas. Livestock producers are busy taking their own or their children’s animals to breed-sponsored and county fairs over the coming weeks, all leading up to regional and state fairs at the end of the summer. But fairgrounds can be a central distribution point for livestock diseases that can ruin your chance at winning the late season shows and affect your herd’s breeding season later this year.

Before you go to your first show this year, there are some steps you can take to reduce the danger of bringing something besides the championship ribbon home! First, make sure your animals are up to date on their vaccinations. A good vaccination program can really reduce the spread of diseases. Make sure your feeding program is meeting all of the nutritional needs of your animals. A well-nourished animal is more resistant to disease than one lacking a critical nutrient.

**Preventing or Managing Bloat**

Bloat is not rare, but seems to be more prevalent under the following conditions:

1. In pastures with a high percentage of clover (over 50 percent clover). This is only a general statement because we have worked with many producers having very high clover percentage in pastures who have never had any bloat in their livestock. Conversely, some producers with low clover percentage have reported bloat where animals selectively grazed clover under the conditions outlined in items 2 and 3 below.

2. In cases where hungry animals are turned into lush clover pasture without being slowly acclimated to the change in diet.

3. In cases where animals are turned into pasture when clover foliage is wet from morning dew or rain.

4. Some animals are more prone to bloat than others.

The foam tends to expand, distending the rumen and putting pressure on the animal’s lungs. Extreme cases can cause death from asphyxiation.

**Recommendations**

The general recommendations to reduce or prevent bloat on clover pasture are:

1. Maintain a good mixture of grass and clover.
2. Avoid sudden diet changes of all hay or all grass pasture immediately followed by lush clover pasture.
3. Allow animals limited access to clover before turning out to pastures with high percentages of clover. Increase access over several days so animals are slowly acclimated before turning out to clover pasture.
4. Avoid turning hungry animals onto lush clover pasture.
5. Provide free access to grass hay or to a bloat preventative (such as Poloxalene) when grazing high percentage clover pasture to reduce bloat.

Legumes can be planted into fescue and cool-season grass sods during fall or in late winter. Planting in late winter (February to early March) is sometimes called “frost-seeding” because freezing and thawing of soil helps work the legume seed into the soil surface. When planting into bermudagrass or bahiagrass sod, plant in early October when the warm-season grass growth has slowed due to cool temperatures. Good clover stands can be established with a no-till drill or by broadcast seeding. Fields should be clipped or grazed as closely as possible to remove the grass canopy and excess thatch before planting. A closely grazed grass stubble of 2 inches or less is ideal. Roughing up the short sod by pulling a harrow, tire drag or even a cedar tree across the field exposes soil and improves legume establishment. White clover is the most popular clover in Arkansas. Seeding rate is 2 to 3 pounds per acre. Red clover is a better option for hay production. Seeding rate is 8 to 10 pounds per acre. To get fertilizer and lime recommendations for overseeding legumes, ask for soil test code #116, Legumes Overseeded Into Grass Sod, when submitting soil samples to the county Extension office.

### Observations of Bloat While Grazing Legumes

![](image)

**Figure 2. Observations of bloat by respondents to the 2011 Legume Management Survey.**

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Introduction

Sheep and goats have a series of four stomachs in their intestinal system, with the largest of these being the rumen. Fermentation takes place in the rumen, which can give rise to gas production. Bloat can be described as an excessive accumulation of this gas in the rumen. Once a meal is consumed, gas (primarily carbon dioxide and methane) is produced by the microbes that break down the contents of the rumen. Normally, this gas is relieved via belching (eructation) by the animal. However, sometimes gas can become trapped, causing the animal to over-accumulate gas, leading to bloat. When bloat occurs, a distention can be noted on the left upper abdomen of the affected animal. A bloating episode could be caused by one of two mechanisms described as either frothy bloat or free gas bloat.

Frothy Bloat

Frothy bloat, sometimes referred to as foamy bloat, can occur from ruminants grazing certain forage types. Legume forages such as white clover, alfalfa, winter wheat, red clover, sweet clover or ladino clover can lead to bloat occurring due to gas bubbles being trapped in foam inside the rumen. Bloat may be observed in as little as 15 minutes once grazing begins on the legume forages, but it generally occurs within two to three hours after grazing occurred on pastures containing one of the above forages. Since the gas is trapped inside the foam, it cannot be eliminated via eructation (belching) by the animal. It continues to build up, causing excessive pressure on the diaphragm, heart and lungs. Affected animals may show signs of abdominal discomfort, increased frequency of urination and/or defecation and possible anxious or belligerent behavior. In extreme cases, the rumen becomes severely distended, leading to restricted breathing and heart failure.

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The danger of frothy bloat is greatest when the forage is young, lush and highly soluble in the rumen. Immature forages that are low in fiber and high in protein set up an ideal environment for frothy bloat to occur. Furthermore, there may be certain individuals in a herd or flock that are predisposed to frothy bloat. They may have certain genetic factors or a decreased saliva production (a natural bloat combatant) that predisposes them to bloat episodes.

Treatment of frothy bloat can be accomplished by first breaking down the froth that is trapping the accumulated gas. This can be done by administering a combination of gases and water, which will cause the foam to break down and the gas to be released. However, in some cases, the foam may be too thick to break down, and the gas will remain trapped, leading to continued bloat.

Try to avoid driving your truck and trailer on the farm before you have a chance to thoroughly clean the tires and under the wheel wells. Wash out the trailer interior so that it drains away from your livestock at home. Manure and contaminated soil from the fair can contaminate your own farm.

Watch out for hazards that can injure your animals. Some of the smaller and older fairgrounds around the state have not been fully maintained. Broken wires and pipes on corrals and pens can cause puncture wounds and serious lacerations. Animals can be injured during loading and unloading or while standing on grooming tables.

Prepare a secure location where you can quarantine your animals when you come home. You should not mix them with the rest of your herd or flock for at least 30 days if you can manage it. This will allow you to see and treat any disease they have brought home without infecting the rest of your herd.

Just a few simple precautions can make the difference between a winning season and a disappointing season spent at home.
gas. This can be done by dosing the animal with a surfactant to reduce the stability of the foam. Common types include poloxalene (Therabloat®), mineral oil, household detergent or DSS (docusate sodium). Once the foam has been broken down, the animal should be able to relieve the released gases via eructation (belching).

**Free Gas Bloat**

Bloat can also be due to a collection of gas in the rumen. This is referred to as free gas bloat because the gas is not trapped inside foam. The cause that is most commonly attributed to free gas bloat is inability of the animal to properly remove the buildup of gas via eructation. A rumen motility deficit is usually the root cause of this problem.

Rumen motility deficits can be caused by many things, including hardware disease, grain overload, rumen impaction due to poor quality forage, hypocalcemia (milk fever) or a neurological dysfunction. Other causes of free gas bloat can be directly related to a blockage of the esophagus. Anything that would directly block or interfere with the eructation process, such as a tumor or foreign body in the esophagus, could lead to gas buildup in the rumen.

Treatment of free gas bloat can be focused on the relief of the collected gases in the rumen. This can be accomplished by one of two methods. A stomach tube can be passed through the mouth and esophagus until it reaches the rumen, allowing the gas to escape through the tube. Another method that can be effective is using a rumen trocar. A trocar is used to insert a hole spanning from the outside of the animal to the inside of the rumen. This hole is placed in the upper left flank to relieve the accumulated gas inside the rumen. Neither the stomach tube nor the rumen trocar method is very effective for frothy bloat. Since the gas is trapped inside foam during frothy bloat, it is unable to be easily alleviated by these two methods.

To find out more about bloat and other diseases, visit your county Extension office.